

**SUMMARY REPORT
AMERICAN RESERVE MINING CORPORATION
KUTCHO CREEK PROJECT
Liard Mining Division
British Columbia**

SUMMARY AND CONCLUSIONS

Three massive sulphide deposits have been identified by past work on the Kutcho Creek property which is situated in a remote area of northern British Columbia. 65% of the largest deposit (Kutcho Zone) and the subeconomic Sumac West Zone are on mineral claims owned by Sumitomo Metal Mining Canada Ltd. The American Reserve - Homestake ground includes 35% of the Kutcho Zone and the smaller but higher grade Esso West Zone.

A recent report, commissioned by American Reserve, estimates mineable reserves as being 14.3 million tonnes grading 1.76% copper, 2.54% zinc, 35 grams/tonne (1.02 oz/ton) silver and 0.37 grams/tonne (0.010 oz/ton) gold. These reserves are contained in the Kutcho Zone (11.6 million tonnes) and the Esso West Zone (2.7 million tonnes). American Reserve - Homestake own 6.8 million tonnes or less than half the estimated mineable reserves.

Capital costs to develop an underground operation to exploit the Kutcho and Esso West zones have been estimated to be \$130.65 million with operating costs in the order of \$23.20/tonne. Projected capital costs do not include a necessary access road (for which an independent estimate is \$25 million) or costs of providing power for the project.

Gross value of the mineralization, based on reported grades, mill recovery rates as determined by previous metallurgical testing and current metal prices, is \$71/tonne. Quoted grades are weighted averages of the Kutcho Zone, which contains 80% of the estimated mineable reserves, and the smaller Esso West Zone in which base metal grades are approximately double those of the Kutcho Zone. Gross value per tonne of the Kutcho Zone alone is about \$65.

The Kutcho Creek project is situated in a remote area of northern British Columbia and metal grades defined to date are considered to be marginal at best. Better base and precious metal grades are required to make this a viable

operation. Such grades may exist within or adjacent to known zones or in other prospective parts of the property but significant exploration expenditures would be required to prove or disprove the existence of higher grades of mineable reserves.

One of the realities of this project that must be addressed is the fact that Sumitomo owns the major portion of the defined reserves and there is currently no agreement in place with respect to how the project should proceed.

INTRODUCTION

This preliminary overview of American Reserve Mining Corporation's Kutcho Creek project was undertaken at the request of Mr. William F. Bernard of TAP Capital Corp. The writer attended a meeting at the Vancouver offices of American Reserve with Mr. Bernard May 2 at which time overviews of the Paymaster and Kutcho Creek projects were presented by Mr. Carl Zuber, president and Mr. Dick Woodcock, geological consultant.

Additional information regarding the Kutcho Creek project was gained by further conversations with Mr. Zuber and a brief examination of several reports on May 6. Mr John Brenner of the B.C. Ministry of Energy Mines and Petroleum Resources provided useful information concerning potential costs of road access in northern British Columbia.

The writer has visited and examined several mineral properties in the Kutcho Creek area over the past 15 years.

LOCATION AND ACCESS

Kutcho Creek is approximately 100 air km east of Dease Lake in northern British Columbia (see attached diagrams). Present access is by aircraft utilizing an airstrip in the Kutcho Creek valley and by a 10 km road to the property.

A summer use only tote road, which leaves highway 37 south of Dease Lake and provides access for placer gold and jade mining operations, extends to within 15 km of the airstrip. It is generally this route that would be upgraded and extended for possible development of this project.

PREVIOUS WORK

Massive sulphide base metal mineralization was jointly discovered by Esso Minerals and an arm of Sumitomo Metal Mining in the Kutcho Creek area in the early 1970's. Subsequent drilling by both companies defined three deposits - the Kutcho, Sumac West and Esso West zones.

One-third of the largest, the Kutcho Zone, and the Esso West Zone are on ground previously held by Esso Minerals and now owned by American Reserve - Homestake Minerals. Two-thirds of the Kutcho Zone and the Sumac West Zone are owned by Sumitomo Metal Mining Canada Ltd. (see plan and section). Total expenditures to date by both parties are in the order of \$35 million. While negotiations have been carried out over many years, there is no joint operating agreement in place.

Homestake Minerals acquired most of Esso Minerals' properties, including Kutcho Creek, in 1989. American Reserve purchased a 60% interest in the Kutcho property by issuance of 870,000 common shares and \$6.5 million in preferred shares in early 1990 and can earn an additional 20% interest by funding \$3 million of exploration expenditures. Homestake retains the right to buy back a 30% interest by redeeming the preferred shares which would effect a 50-50 joint venture.

American Reserve provided Homestake, the operator, with \$1.2 million in 1990. Work done included drill testing of geophysical anomalies in the southern property area and some drilling along strike from known deposits.

GEOLOGICAL SETTING

The Kutcho Creek deposits occur as conformable lenses at a specific stratigraphic interval within a late Triassic volcanic sequence. The deposits consist of massive sulphides including pyrite, and copper and zinc sulphide minerals. The three principal deposits, referred to earlier and shown on the accompanying plan and section, are developed over a 3.5 km strike length.

The Kutcho Zone, the largest, has geological reserves of 17 million tonnes grading 1.62% copper, 2.32% zinc, 29.2 g/t (0.85 oz/ton) silver and 0.3 g/t (0.009 oz/ton) gold. The Esso West Zone reportedly has reserves of 2.7 million tonnes with double the base metal grades of the Kutcho Zone while the

10 million tonne Sumac West Zone, with grades of 1% copper and 1.2% zinc, is considered to be sub-economic.

The three zones have an average dip of 50 degrees to the north. The width of the Kutcho Zone ranges from 3 to 30 metres with an overall average of 15 metres while the average width of the Esso West Zone is 10 metres.

Mineral claims held by American Reserve - Homestake include extensions of the favourable volcanic stratigraphy considered to be prospective for the discovery of additional massive sulphide lenses. Drilling testing of geophysical anomalies along these trends has not been encouraging to date although there are apparently indications of additional mineralization east of the known limits of the Kutcho Zone.

KUTCHO AND ESSO WEST ZONES

Two pre-feasibility studies have been undertaken on the Kutcho Creek project. Sumitomo Metal Mining Canada Ltd. commissioned a report by Wright Engineers in 1985 which incorporated metallurgical test work on a 149 tonne underground bulk sample extracted from the Kutcho zone in 1982.

The Wright Engineers report proposed an open pit mining plan for the Kutcho Zone with operating costs of \$33.32/tonne and estimated capital costs of \$145 million which included a 4000 tonnes per day mill. An 11.9% rate of return was forecast assuming copper prices of US\$0.95/lb. and the project was deemed to be marginal.

Significantly, the Wright Engineers report referred to complex flotation with expensive reagents comprising 60% of anticipated direct milling costs.

American Reserve Mining Corporation recently received an updated pre-feasibility study from Laxey Mining Services which proposed mining of the Kutcho and Esso West zones by trackless underground methods. The Laxey report estimates capital costs of \$131 million, broken down as follows:

Capital Costs	
(4400 tonnes per day mill and plant)	\$93.75 million
Pre-production development costs	\$26.40 million
Working Capital	\$10.50 million

Operating costs are forecast as follows:

Mining	\$7.79
Milling	\$9.94
Plant	\$4.08
Administration	<u>\$1.89</u>
	\$23.70/tonne

Note that the preceding are direct operating costs and do not include concentrate transportation costs or smelting and refining charges, nor is there any provision for amortization of capital.

Mineable reserves at a 1.8% copper-equivalent cut-off grade and a 23% dilution rate are estimated to be:

14.3 million tonnes - 1.76% copper
2.54% zinc
35 g/t(1.02 oz/ton) silver
0.37 g/t (0.010 oz/ton) gold

11.6 million tonnes or 80% of the mineable reserves are contained in the Kutcho Zone with the remainder (2.7 million tonnes) in the higher grade Esso West Zone which raises the overall grade somewhat.

Mill recovery rates as cited in the Laxey report are probably based on earlier metallurgical tests and are as follows:

Copper	86%	(26% copper concentrate grade)
Zinc	80%	(55% zinc concentrate grade)
Silver	53%	(contained in copper concentrate)
Gold	35%	(" " ")

Gross value per tonne, based on the foregoing metal grades and recoveries and May 3, 1991 metal prices in \$C (gold-\$408/oz.; silver-\$4.55/oz.; copper-\$1.26/lb.; zinc-\$0.71/lb.) is:

Copper	\$38.18
Zinc	\$28.85
Silver	\$2.45
Gold	<u>\$1.53</u>
	\$71.01/tonne

PROJECT ECONOMICS

The estimated gross value per tonne of \$71 is low in comparison to similar, viable massive sulphide deposits elsewhere in British Columbia. A good example of one of these is the Westmin Resources mine on Vancouver Island which has processed more than 9 million tonnes since 1966 with *recovered* grades of 2.11% copper, 7.22% zinc, 0.78% lead, 84 grams/tonne (2.43oz/ton) silver and 2.09 grams/tonne (0.060 oz/ton) gold. The gross value per tonne of Westmin ore at current metal prices is approximately \$200 and significantly, gold and silver make up 18% of the gross value as compared with 6% of the estimated gross value at Kutcho Creek.

To put it another way, the Kutcho Creek gross value per tonne is equivalent to a gold deposit grading 0.174 oz/ton which would be marginal or sub-economic at current prices virtually anywhere in Canada.

The Homestake Golden Bear gold mine at Muddy Lake, 200 km west of Kutcho Creek (see diagram) provides a useful comparison of capital and production costs for a project in a remote location similar to Kutcho Creek. Capital costs were more than double original estimates and the company recently took a \$24 million write down; operating costs per ounce of gold produced are reportedly nearly double the current gold price.

The Laxey Mining Services report on Kutcho Creek suggests an after tax rate of return of 15% and a net present value of the Kutcho deposits of \$27.4 million. As noted previously, projected capital costs do not include costs of an access road or power generation.

Cost of the proposed 110 km of road from highway 37 south of Dease Lake into the Kutcho project are estimated by an employee of the Ministry of Energy Mines and Petroleum Resources as being as high as \$225,000/km or approximately \$25 million. This would provide a 5 metre wide all-weather road with pullouts at frequent intervals. This same individual advised Homestake several years ago that their projected \$7 million for road construction into the Golden Bear project would be 2.5 times that amount - actual costs turned out to be between \$18 and \$20 million.

The Provincial Government has provided some assistance for mining access roads in the recent past, generally by way of assistance with engineering and design and if construction

capital has been provided, it has generally been by way of repayable interest-bearing loans. Road projects that have received assistance involve access routes to service more than one mining project, however.

An access road is necessary for shipment of concentrates and supplies. It is likely that the workforce would travel by air from a central point to an upgraded airstrip on a rotation basis.

Transportation of concentrates from a potential operation at Kutcho Creek would be by the access road and highway 37 to the deep sea port at Stewart, a distance of 500 km. (see sketch map). It is anticipated that 10 trucks would operate each way daily with supplies brought in on the backhauls.

PROPOSED FUTURE PROGRAMS

Some of the unknowns at present are the precise costs of underground mining. Current proposals call for mining from the hangingwall of the Kutcho and Esso West zones - both have an average dip of 50 degrees necessitating considerable development work from 4 adit entries on the Kutcho Zone and a shaft to access the Esso West Zone 1500 metres west-northwest and 500 metres below surface (see plan and section).

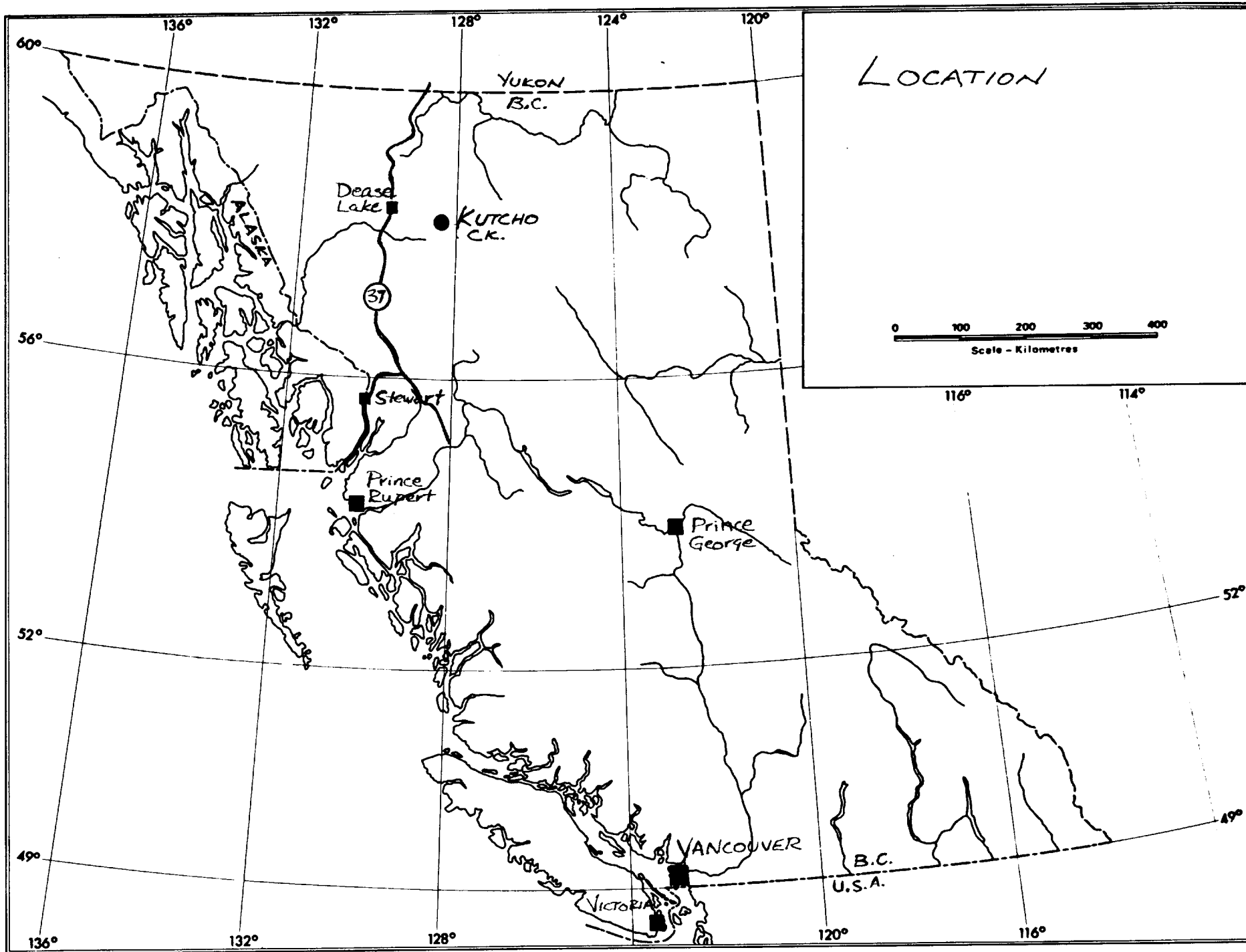
Better efficiencies might be achieved by mining from the footwall and American Reserve's proposed \$2.35 million 1991 program is planned to test the footwall ground conditions by extending the existing Sumitomo crosscut adit and drifting east and west on the footwall. A 300 tonne bulk sample would be collected for additional metallurgical testing and a closely spaced underground drilling program would further test the distribution of grades within the zone. This work would obviously require the cooperation of Sumitomo and Mr. Zuber suggests that they may defray half the costs of such a program.

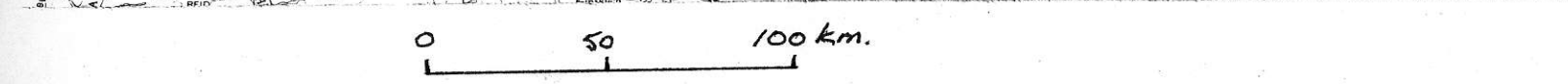
In view of the low overall grades, the \$909,000 program proposed by Homestake to carry out additional drilling to test extensions of known zones and other prospective parts of the property might make more sense.

May 9, 1991

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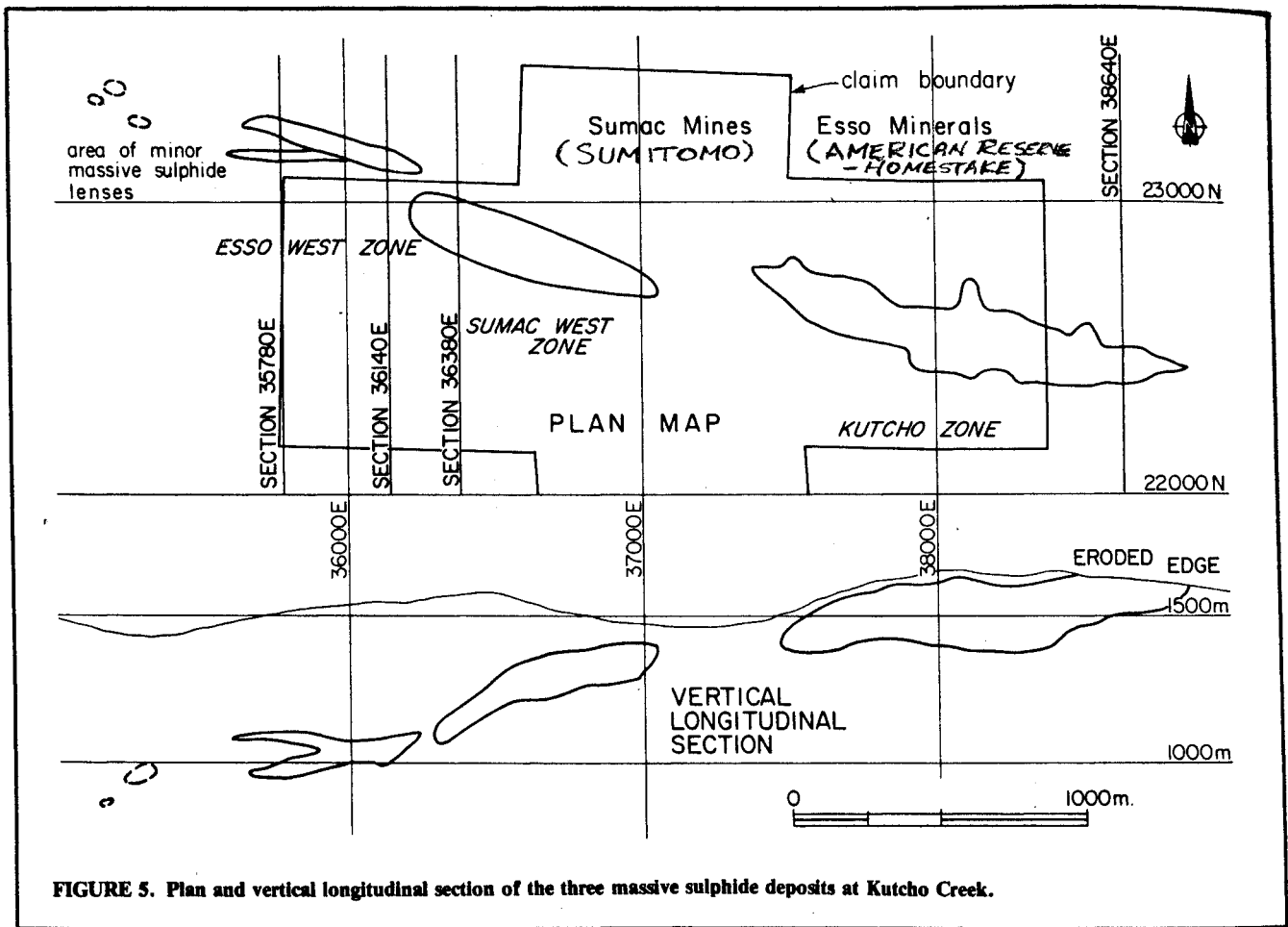


FIGURE 5. Plan and vertical longitudinal section of the three massive sulphide deposits at Kutcho Creek.

Minor fracture controlled copper mineralization is present in a number of places. A large outcrop area of coarse felsic pyroclastics is located about 600 metres north of the main area of mineralized float boulders.

Four diamond drill holes (from two set-ups) were bored by St. Joe Minerals Inc. in 1984. However, none of these holes tested a coincident magnetic and VLF EM feature occurring near the center of the glacier.

Exploration Potential

The New Moon Property covers a very large mineralized system. Two differing types of mineralization appear to be roughly grouped and may represent a crude zoning, further complicated by later intrusion and remobilization. A number of the copper rich showings have characteristics which suggest an original volcanogenic setting. Given the size of the system, there is potential for a large tonnage, polymetallic massive sulphide deposit with precious metal credits. The target envisioned is 20 to 30 million tons of massive sulphide (e.g. the size of the Westmin HW deposit or the Craigmont deposit).